

Hemolytic Uremic Syndrome (HUS) Cases Identified in the 1996 FoodNet *Escherichia coli* O157:H7 Surveillance

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Background: As part of the CDC Emerging Infections Program, active surveillance for *E. coli* O157:H7 was established in 1995 in five locations; Minnesota (MN), Oregon (OR), and select counties in California (CA), Connecticut (CT), and Georgia (GA). Physician diagnosed cases of HUS were identified and characterized by symptom history, demographics, and possible risk factors associated with illness.

Results: During 1996, 372 cases of *E. coli* O157:H7 were identified from the five active surveillance sites. The annual incidence rates of reported *E. coli* O157:H7 for the sites were GA-0.6, CA-0.9, CT-2.3, OR-2.5, MN-5.2 cases per 100,000 population. Twenty-six cases of HUS were identified. The annual incidence rates of reported HUS by site were CA-0.04, GA-0.13, OR-0.11, CT-0.18, MN-0.37 cases per 100,000 population. The percentage of diagnosed *E. coli* O157:H7 cases with HUS was OR-4.2%, CA-5.3%, MN-7.0%, CT-7.7%, and GA-23.1%. The median age of *E. coli* O157:H7 cases with and without HUS was 6 and 12 years, respectively ($p=0.13$). Compared to patients without HUS, those who developed HUS were significantly more likely to experience fever (75% vs. 51%, $p=0.02$), vomiting (76% vs. 46%, $p<0.05$), and have more than 20 bowel movements within a 24-hour period (57% vs. 35%, $p=0.04$). All HUS cases were hospitalized versus 34% of cases without HUS. No risk factors for the development of HUS were identified. Nine percent of patients who received antibiotic treatment went on to develop HUS versus 8% of patients, who did not receive antibiotics.

Conclusions: There were regional differences in both *E. coli* O157:H7 and HUS incidence among the five sites. These differences may be explained by the regional variability of *E. coli* O157:H7 detection, exposure and completeness of reporting.

Table 1

Incidence Rates of *Escherichia coli* O157:H7 Infections and Hemolytic Uremic Syndrome Cases by Site.

FoodNet Site	HUS Number (incidence)*	<i>E. coli</i> O157:H7 Number (incidence)*	HUS/ <i>E. coli</i> O157
California	1(0.04)	19(0.9)	5.3%
Connecticut	3(0.18)	39(2.3)	7.7%
Georgia	3(0.13)	13(0.6)	23.1%
Minnesota	16(0.37)	229(5.2)	7.0%
Oregon	3(0.11)	72(2.5)	4.2%
*per 100,000 population			

Table 2. Demographic Characteristics of *E.coli* O157:H7 Gastroenteritis and *E. coli* O157:H7 HUS Patients, 1996

	HUS (n=26) Number (%)	Gastroenteritis (n=346) Number (%)
Sex		
Male	10 (38.5)	152 (43.9)
Female	15 (57.7)	163 (47.1)
Unknown	1 (3.8)	31 (9.0)
Race		
White	21 (84.0)	270 (78.5)
Black	—	8 (2.3)
Asian	1 (3.8)	6 (1.7)
Native American	1 (3.8)	1 (0.3)
Unknown	3 (11.5)	61 (17.6)
Age (years)		
< 5	8 (30.8)	87 (25.1)
5 - 9	7 (26.9)	60 (17.3)
10 - 14	4 (15.4)	37 (10.7)
15 - 19	1 (3.8)	27 (7.8)
20 - 24	—	19 (5.5)
25 - 34	—	15 (4.3)
35 - 44	—	21 (6.1)
45 - 54	1 (3.8)	23 (6.6)
55 - 64	2 (7.7)	16 (4.6)
65+	2 (7.7)	28 (8.1)
Unknown	1 (3.8)	13 (3.8)
Residence		
Urban or Suburban	20 (76.9)	162 (46.8)
Rural	1 (3.8)	59 (17.1)
Unknown/Don't know	5 (19.2)	125 (36.1)

Table 3. Presenting Symptoms and Severity of illness

Symptom	HUS		Gastroenteritis	
	No. of Responses	Number (%)	No. of Responses	Number (%)
Abdominal cramps	24	23 (95.8)	271	254 (93.7)
Diarrhea	25	25 (100)	325	299 (92.0)
Bloody diarrhea	25	25 (100)	282	251 (89.0)
Large amount of blood	20	12 (60.0)	228	130 (57.0)
>20 bowel movements in 24 hours	21	12 (57.1)	271	94 (34.7)
Vomiting*	25	19 (76.0)	278	128 (46.0)
Fever*	24	18 (75.0)	259	132 (51.0)
Hospitalized*	25	25 (100)	271	91 (33.6)
median length of stay*		9 days		4 days
*statistically significant				

Suggested citation:

Bender J, Mead P, Voetsch D, Vugia D, Fiorentino T, Koehler J, Shiferaw B, Griffin P. Hemolytic Uremic Syndrome (HUS) Cases Identified in the 1996 FoodNet *Escherichia coli* O157:H7 Surveillance. 1st International Conference on Emerging Infectious Diseases. Atlanta, GA, March 1998.